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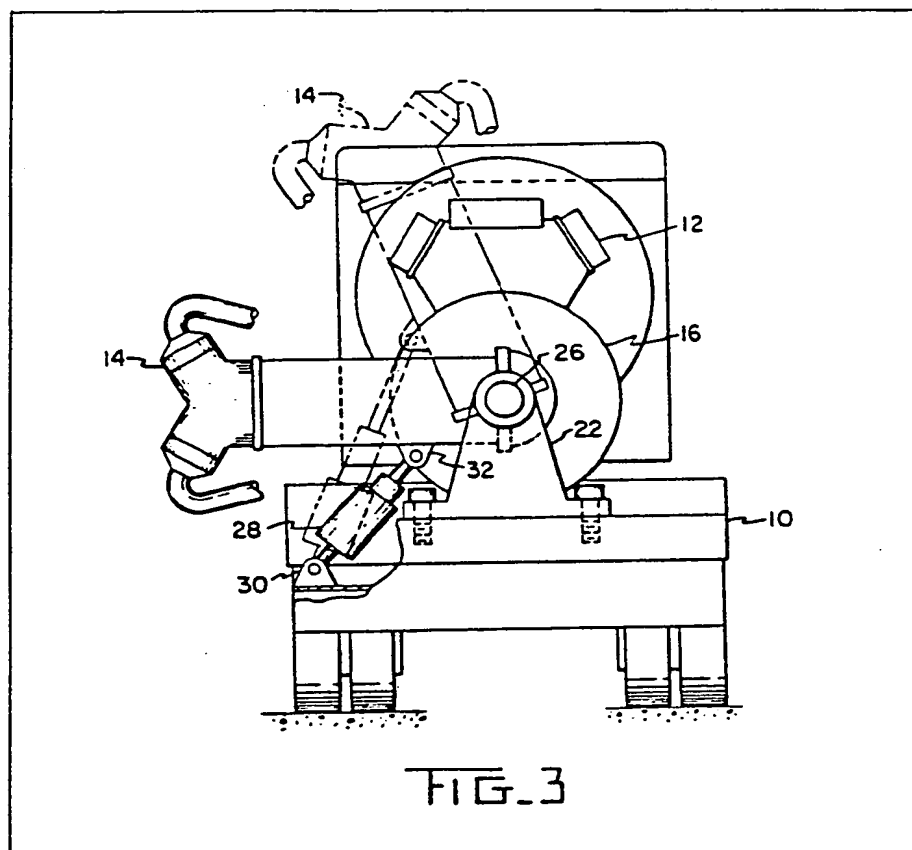
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(54) Pump transport vehicle

(57) A pump transport vehicle, such as a truck for carrying oil well service pumps, is provided with a pump 14 having a horizontal drive shaft journaled in a pair of spaced trunnions 26 fixed to the truck bed. Means 28 are provided for rotating the pump about its drive shaft between

horizontal and upwardly tilted positions. The pump extends outside road width limits in its horizontal operative position, but is within both width and height limitations in the tilted transport position. This arrangement does not require disconnection of the pump from its drive prior to rotation.



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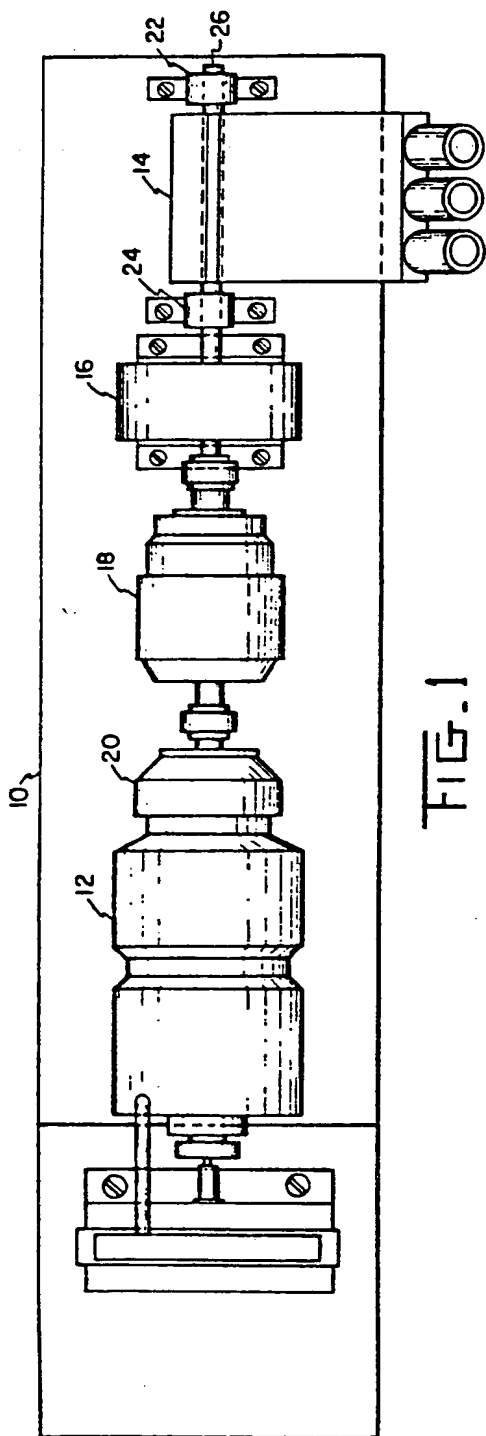


FIG. 1

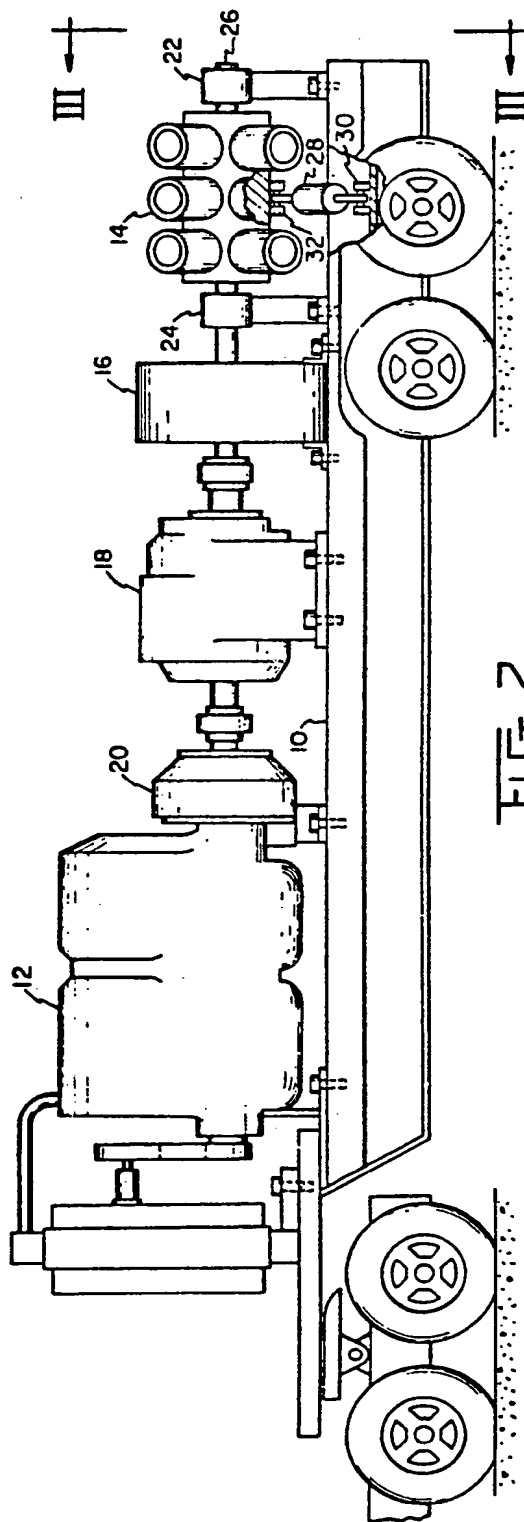


FIG. 2

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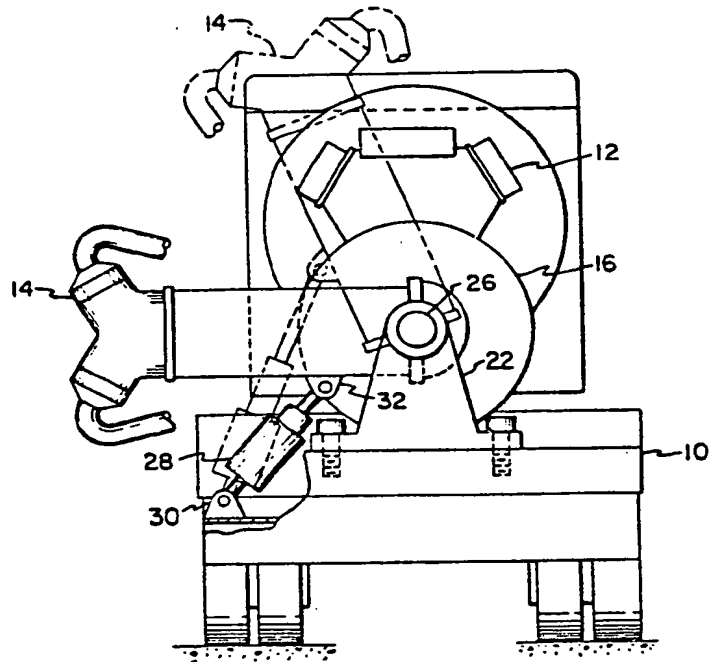


FIG. 3

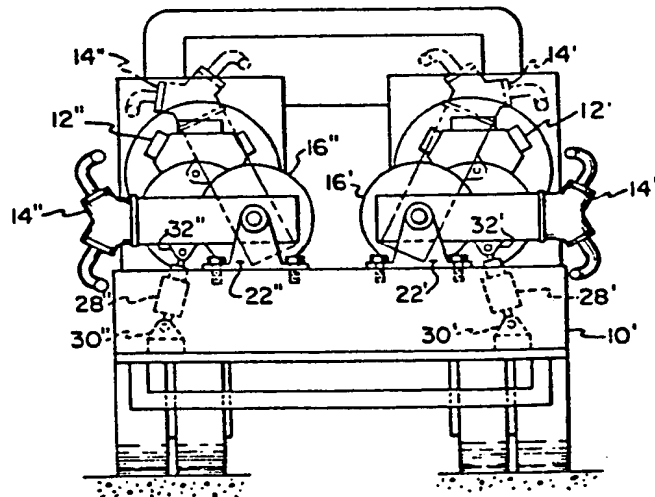
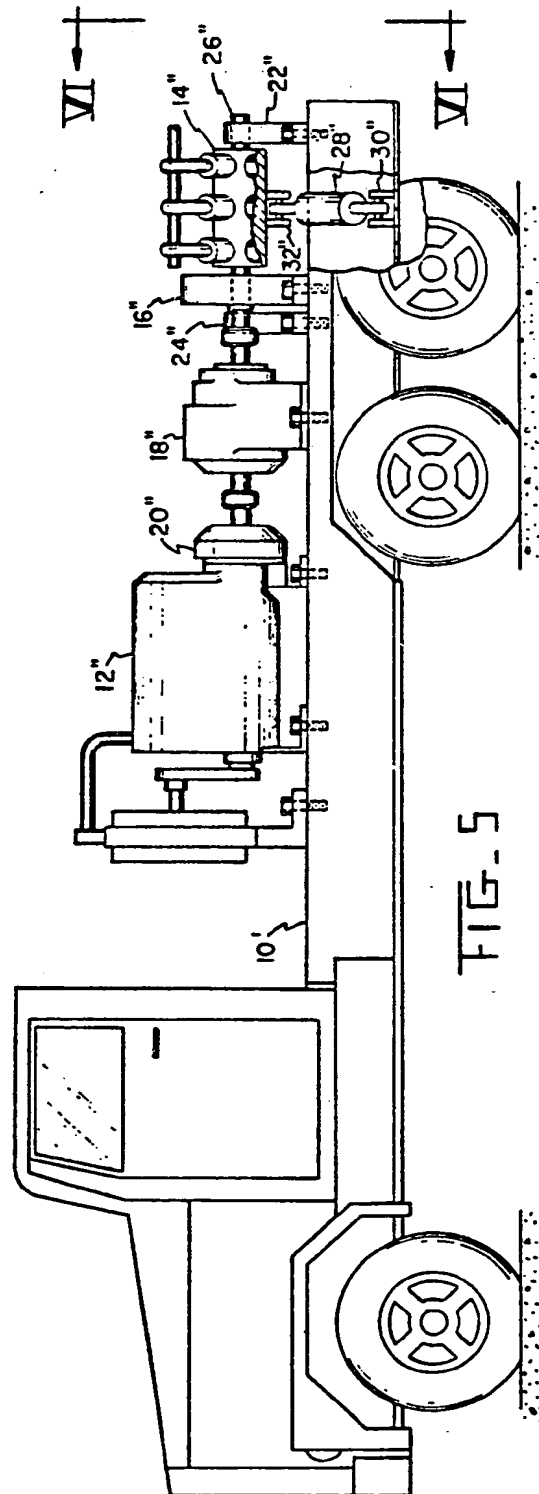
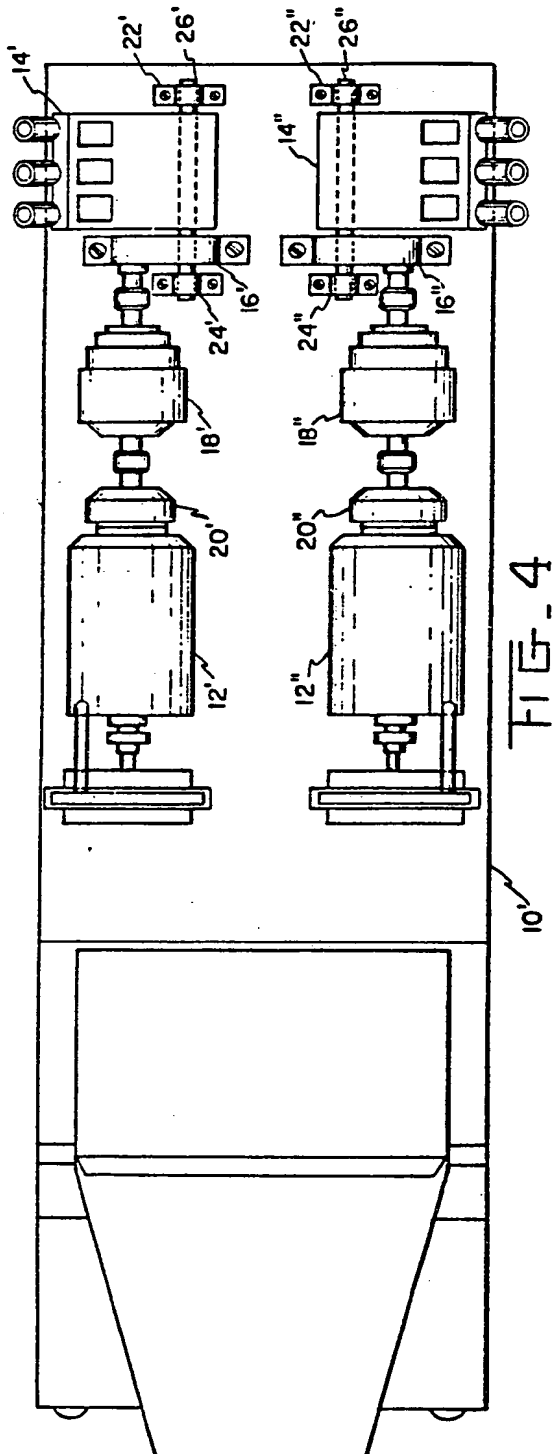


FIG. 6

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SPECIFICATION

Pump transport vehicle

This invention relates to a pump transport vehicle particularly a truck for carrying oil well service pumps.

During oil well drilling operations it is necessary to apply mud pumps of increased power output to the well as the depth of drilling increases. Auxiliary service pumps carried on highway vehicles may be readily moved from one well site to another to supply the additional capacity needed. With the drilling of ever deeper wells it has been recognized that larger capacity auxiliary pumps are required. Thus, to avoid having to provide two or more trucks carrying small pumps, ways were sought to mount single larger pumps on one truck. The larger pumps however, extend outside legal road width limits when mounted on the vehicle.

One approach to solving the problem is illustrated in United States Patent Specification No. 3,039,396 in which a rotary table is provided for swinging the pump horizontally between respective operative and transport positions. A disadvantage of this arrangement is that the pump must be disconnected from its drive motor before it is moved to the transport position, and then carefully realigned and connected to the drive motor again after its return to the operative position.

Also, for many years pairs of smaller pumps have been mounted on well service trucks. A right angle worm gear has been utilized to connect the pumps to diesel engines. The pumps were mounted laterally but offset from the drive means so as not to overhang beyond legal width limits. This arrangement requires more complex and expensive drive connections.

A primary object of the present invention is to provide a pump transport vehicle capable of carrying one or more large capacity pumps without requiring complex drive connections or disconnection from a drive motor prior to movement between operative and transport positions.

According to the present invention, there is provided a pump transport vehicle comprising a road vehicle, a pump mounted on the vehicle and having a horizontal drive shaft extending to a motive drive means fixed on the vehicle, the pump being mounted on the vehicle by a pair of trunnions fixed on the vehicle and journaling the horizontal drive shaft of the pump at opposite ends of the pump, and the vehicle having means for rotating the pump about the drive shaft between a laterally extending operative position and an upwardly tilted transport position.

The main advantage of this arrangement is that the pump need not be disconnected from the motive drive means prior to rotation to the transport position, and therefore does not require remaking such connections when it is rotated to the operative position. Preferably a locking pin arrangement is provided for securing the pump in its respective positions. The invention is

particularly applicable to oil well service trucks for carrying auxiliary mud pumps. In an alternative arrangement, two pumps may be mounted on the truck, each having its own motive drive means, and each being tiltable to an inclined transport position within legal width and height limits for highway operation.

The invention is further described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a plan view of a pump transport vehicle constituting one embodiment of the present invention,

Figure 2 is a side elevation of the vehicle of Figure 1,

Figure 3 is an end view of the vehicle taken on line III—III of Figure 2,

Figure 4 is a plan view of a second embodiment of the present invention,

Figure 5 is a side elevation of the embodiment of Figure 4, and

Figure 6 is an end view taken on line VI—VI of Figure 5.

Figures 1, 2 and 3 show a trailer 10 for a well service truck. A diesel engine 12 is mounted substantially on the longitudinal centerline of the trailer for stability during highway transport. A mud pump 14 extends across the trailer and beyond the legal road width limit. The pump 14 is connected to the engine 12 by a planetary gear reducer 16, power transmission 18 and torque converter 20, all of known design. The pump 14 is modified in having its drive shaft 26 extended so as to protrude outwardly from both ends. A pair of trunnions 22, 24 is secured to the trailer bed and journal opposite ends of the drive shaft 26.

Means for rotating the pump 14 about its drive shaft 26 from an operative position (shown in full lines in Fig. 3) to a transport position (shown in phantom outline), mounted in clevises 30, 32 secured to the trailer bed and pump body, respectively. Alternatively, a screw jack or other actuator may be used in place of the cylinder. Locking pins (now shown) may be provided to secure the pump in the alternative transport and operative positions.

Trunnions may be provided for journaling the shaft of planetary gear reducer 16 as well as the pump drive shaft. In this case the cylinder 28 would be connected to a frame supporting both the pump 14 and reducer 16 so as to rotate them together.

Referring to Figures 4, 5 and 6, the second embodiment has two pumps 14' and 14" mounted on truck bed 10'. Each pump is mounted on trunnions 22', 22" and 24', 24" journaling opposite ends of their respective drive shafts 26', 26". Hydraulic cylinders 28', 28" serve to raise and lower the pumps. The cylinders are pivotably mounted on pins in clevises 30', 30", 32', 32" secured to the vehicle and pump bodies, respectively. Separate motive means spaced equally from the truck centerline are provided and included diesel engines, 12', 12", planetary gear reducers 16', 16", power transmissions 18', 18"

and torque converters 20', 20", all of known design. Thus, where desirable, two pumps may be mounted on the truck and provide additional capacity as well as flexibility in use at the well site.

5 CLAIMS

1. A pump transport vehicle comprising a road vehicle, a pump mounted on the vehicle and having a horizontal drive shaft extending to a motive drive means fixed on the vehicle, the pump
10 being mounted on the vehicle by a pair of

trunnions fixed on the vehicle and journaling the horizontal drive shaft of the pump at opposite ends of the pump, and the vehicle having means for rotating the pump about the drive shaft
15 between a laterally extending operative position and an upwardly tilted transport position.

2. A pump transport vehicle constructed and adapted to operate substantially as hereinbefore described with reference to and as illustrated in
20 Figures 1 to 3 or Figures 4 to 6 of the accompanying drawings.

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